

Case Report

Acute Pulmonary Embolism after catheter cryoballoon ablation of atrial fibrillation

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Short Title: acute PE after A Fib cryoablation

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Keywords : pulmonary embolism , PE , venous thromboembolism , VTE , cryoablation , atrial fibrillation ,

Key clinical message

despite being rare ,PE after AF catheter ablation is a serious complication and if missed can be life threatening .so it's need early recognition with high index of suspicion and appropriate management .

Abstract

Periprocedural venous thromboembolisms (VTEs) are a rare occurrence but a critical complication after catheter ablation of atrial fibrillation (AF) , , here we report a 39 year old gentleman treated for paroxysmal atrial fibrillation with catheter cryoablation , while was compliant to anticoagulation with DOAC dabigatran . one week later he developed acute PE .

Authors contributions:

Bara M. AL-Qudah & Mohammad Alzyoud contributed in writing the case , literature review and editing .

Mohammad Kays contributed to the discussion and literature review .

Khalid Sherif contributed in clinical care and the manuscript review .

Introduction

Atrial fibrillation (AF) is the most common sustained arrhythmia and is associated with heart failure, thromboembolic events, hospitalizations and cognitive dysfunction [1]. Catheter ablation should be considered as first-line therapy to prevent recurrent AF and to improve symptoms in selected patients with symptomatic paroxysmal AF as an alternative to AAD and in persistent or long-standing persistent AF patients refractory to AAD, considering patient choice, benefit, and risk [2].

Femoral venous access for catheter introduction represents the cornerstone of electrophysiology (EP) procedures. A recent systematic review showed The incidence of DVT after AF and non-AF ablations reached as high as 0.33% and 2.38%, respectively, with a pooled incidence of 0% (95% CI, 0%-0.0003%) and 0.24% (95% CI, 0.08%-0.39%), respectively. The incidence of PE was 0.29% after AF ablation and ranged from 0% to 1.67% for non-AF procedures; the pooled incidence after non-AF ablations was 0.12% (95% CI, 0%-

0.25%). Asymptomatic DVT was documented in up to 21.2% of patients [3].

A recent observed study assessed the safety of DOAC for AF peri-procedure anticoagulation, revealed an extremely low incidence of symptomatic VTEs. incidence was (0.091%) and no PE detected [4].

This case report demonstrate a patient who presented with acute PE following the catheter ablation of A Fib.

Case Report/Case Presentation

A 39 years old male, known case of A fib which was treated by balloon cryo-ablation and was on anticoagulation with dabigatran 150 mg BID. compliant to the medication.

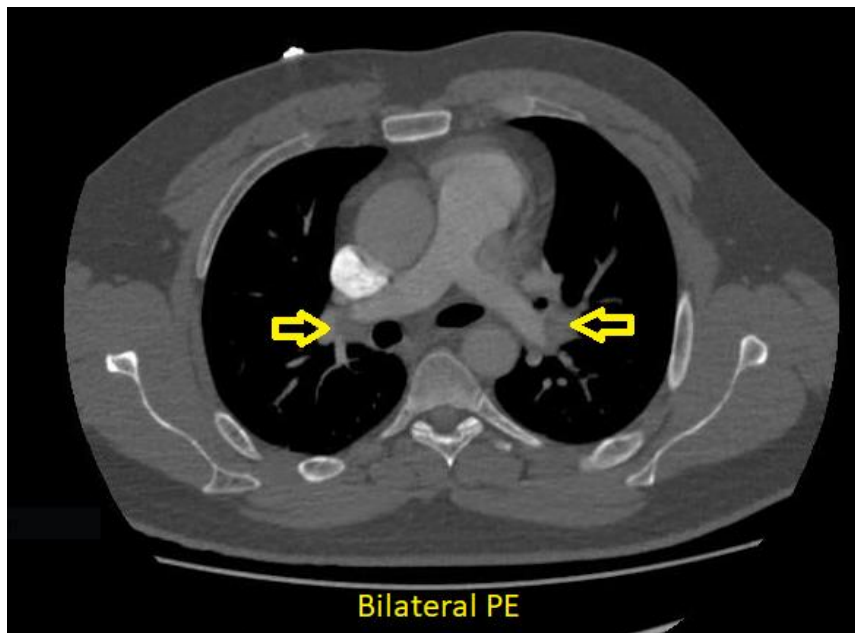
after one week of the procedure he presenting to the ED complaining of chest pain acute onset. was very severe, no radiation, sharp stabbing in severity, then decreased gradually. he had tachypnea.

no previous history of similar chest pain, no sweating, no palpitations.
no pain or swelling at the entrance site of the previous catheter ablation, both thighs are symmetrical. no history of thrombosis before, no family history of thrombophilia.
no skin rashes or joint pain. patient is obese with BMI > 35.

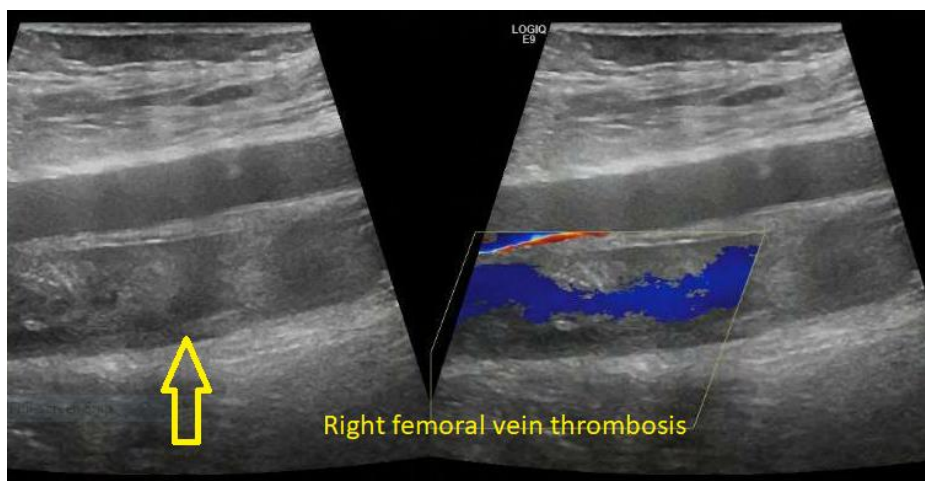
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ECG showed sinus tachycardia. D-Dimer was high 11.2 (mg/L).

CT pulmonary angio was done, showed There are multiple filling defects seen along bilateral pulmonary arteries predominantly in the descending pulmonary arteries extending into their lobar and segmental branches.



US duplex done to evaluate for the DVT on the previous catheter site as the source of the PE , showed : Doppler features are suggestive of deep vein thrombosis involving right common femoral and proximal superficial femoral veins .



Patient was started on enoxaparin therapeutic dose bridged with warfarin , and discharged with warfarin with cardiology and medicine follow up .

Discussion/Conclusion:

Clinical cardiac EPS with or without RFCA is an important component of the diagnostic and therapeutic work-up of serious arrhythmias. RFCA following EPS has become the treatment of

choice for a wide variety of arrhythmias, including AF, atrial flutter, and supraventricular and ventricular tachycardias(5)

Ablation strategies that target the PVs and/or PV antrum are the cornerstone for most AF ablation procedures (6)

PE complicated by EPS is rare, with previous studies demonstrating an overall incidence of 0–0.25 % (7,8,9,10)

PE following EPS can be either benign and asymptomatic, or symptomatic with life-threatening consequences requiring urgent intervention (7,8,10,11)

There are various risk factors associated with VTE, including obesity, immobilization, hospitalization, malignancy, long flights, the use of the combined oral contraceptive pill, and central venous catheterization (13) . Having ruled out the other risk factors associated with VTE in our patient(Apart from obesity) , his recent femoral vein catheterization for EPS remained as the evident cause for the development of DVT and PE.

The source for PE is often attributed to a DVT arising from the punctured femoral vein (6). Venous catheterization and the use of multiple venous sheaths inserted into a single femoral vein is an essential component of most EPS and RFCA (6,14) . Multiple intracardiac catheters are often necessary for EPS and RFCA therapy, and this almost always requires multiple venous sheath placements in a single femoral vein (15) .

Evidence from this case and others (6,12) suggests that, although rare, VTE and PE are potentially life-threatening in certain patients after EPS. Based on the frequency and potential long-term complications of PE, there is a pressing need for more evidence-based consensus concerning the issues of anticoagulation and the prevention of VTE during routine EP procedures (12).

To compare our case report with previous mentioned case reports , our patient was on DOAC (Dabigatran) and developed symptomatic PE , one study was done by Sasaki T, Nakamura K, Minami K, et al , A total of 2,193 consecutive patients undergoing AF catheter ablation with periprocedural DOACs were retrospectively analyzed. Two patients (0.091%) experienced symptomatic DVTs after the ablation, and no patients had any PTEs. One patient was a 72-year-old female who underwent cryoballoon ablation with

periprocedural apixaban at a dose of 2.5 mg twice daily. The other patient was a 74-year-old male who underwent a Hot Balloon ablation and thereafter radiofrequency catheter ablation for recurrent AF with edoxaban at 30 mg once daily. Both DVT patients underwent AF ablation by the right femoral vein approach, and after discharge had right leg pain and swelling on post-procedural days 4 and 8, respectively. The DVT was treated by increasing the dose of apixaban and changing it from 30 mg/day of edoxaban to 15-30 mg/day of rivaroxaban, and the thrombi completely disappeared in both patients without any thromboembolic and hemorrhagic complications (16)

Conclusions

AF catheter ablation with periprocedural DOAC treatment revealed an extremely low incidence of symptomatic VTEs, a serious complication that need early recognition , which may be successfully treated by increasing the DOAC dose or changing the DOAC type.

Acknowledgement

Authors would like to acknowledge internal medicine residency program for scientific support

Statement of Ethics

The case approved by Hamad Medical Corporation medical research center and the patient gave written informed consent to publish his case information and details .

Disclosure Statement

The authors have no conflicts of interest to declare.

Funding Source: Qatar National library

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